CLAIMS

We claim:

1. An antenna system, comprising:
at least one antenna radiating element; and
a first conductive ground plane spaced from said at least one antenna radiating element, said first conductive ground plane comprising a conductive fluid.

2. The antenna system according to claim 1 further comprising a plurality of said antenna radiating elements disposed on a substrate surface, at least one set of said plurality of antenna radiating elements dimensioned for operating on a separate frequency band as compared to a second set of said plurality of antenna radiating elements.

3. The antenna system according to claim 2 further comprising a second conductive ground plane, said first conductive ground plane disposed between said second conductive ground plane and said radiating elements.

4. The antenna system according to claim 1 wherein said conductive fluid is disposed within at least one cavity defined within a dielectric structure.

5. The antenna system according to claim 4 wherein said dielectric structure forms a continuous sheet between said antenna radiating elements and said second conductive ground plane.

6. The antenna system according to claim 4 wherein said conductive fluid is disposed within a network of channels defined within said dielectric structure.

7. The antenna system according to claim 6 wherein said network of channels are arranged in the form of a grid pattern.

8. The antenna system according to claim 6 wherein said network of channels are arranged and spaced so to prevent the transmission through said network of channels of RF at an operating frequency of said at least one antenna radiating element.

9. The antenna system according to claim 4 wherein said dielectric structure is arranged in the form of a grid pattern.

10. The antenna system according to claim 1 wherein said conductive fluid is selected from the group consisting of a metal or a metal alloy that is liquid at room temperature, and a solvent electrolyte mixture.

11. The antenna system according to claim 1 further comprising at least one fluid control system for selectively purging said conductive fluid from said first ground plane responsive to a control signal.

12. The antenna system according to claim11 wherein said control system is comprised of at least one pump and one valve.

13. The antenna system according to claim 11 wherein said fluid control system replaces said conductive fluid with a dielectric fluid responsive to a second control signal.

14. A method for dynamically changing an effective distance between an antenna radiating element and a ground plane, comprising the steps of:

positioning at least one antenna radiating element at a location spaced from a dielectric structure;

responsive to a control signal, injecting a conductive fluid into at least one cavity contained within said dielectric structure to form a first ground plane for said at least one antenna radiating element.

15. The method according to claim 14 further comprising the step of purging said conductive fluid responsive to a control signal to expose said at least one antenna radiating element to a second conductive ground plane.

16. The method according to claim 14 further comprising the steps of positioning a plurality of said antenna radiating elements on a substrate surface and dimensioning at least one set of said plurality of antenna radiating elements for operating on a separate frequency band as compared to a second set of said plurality of antenna radiating elements.

17. The method according to claim 16 further comprising the step of positioning said dielectric structure at a location disposed between said radiating elements and a second conductive ground plane.

18. The method according to claim 14 further comprising the step of forming said dielectric structure as a continuous sheet.

19. The method according to claim 14 further comprising the step of injecting said conductive fluid into a network of channels defined within said dielectric structure.

20. The method according to claim 19 further comprising the step of arranging said network of channels in the form of a grid pattern.

21. The method according to claim 19 further comprising the step of arranging said network of channels with a spacing selected to prevent the transmission through said network of channels of RF at an operating frequency of said at least one antenna radiating element.

22. The method according to claim 14 further comprising the step of selecting said conductive fluid from the group consisting of a metal or a metal alloy that is liquid at room temperature, and a solvent electrolyte mixture.

23. The method according to claim 14 further comprising the step of replacing said conductive fluid with a dielectric fluid responsive to a second control signal.